DOCUMENT RESUME

ED 472 470 HE 035 629

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TITLE	Learning Styles: Student Preferences vs. Faculty Perceptions. AIR 2002 Forum Paper.
PUB DATE	2002-05-31
NOTE	29p.; Paper presented at the Annual Forum for the Association for Institutional Research (42nd, Toronto, Ontario, Canada, June 2-5, 2002).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	Active Learning; *College Faculty; *College Students; Cooperative Learning; Higher Education; Student Participation; Surveys; *Teacher Attitudes; *Teaching Methods
IDENTIFIERS	*Student Preferences

ABSTRACT

This study examined the attitudes, beliefs, and experiences of faculty and students about the use of nontraditional pedagogies such as active learning, collaborative/cooperative learning, and the encouragement of student participation and involvement in the learning experience. The data came from two surveys of faculty (n=136) and students (n=676) conducted through the National Center for Postsecondary Improvement at seven institutions during the winter and fall of 2000. The result reveal that both groups agree on the value and desirability of direct involvement in learning, academic collaboration with student peers, and productive, constructive student/faculty relationships. There are substantial, statistically significant differences, however, between how frequently they believe these practices are actually enacted in the classroom. Possible explanations and implications are discussed. (Contains 7 tables and 33 references.) (Author/SLD)

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Learning Styles:
Student Preferences vs. Faculty Perceptions

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HE 035 629

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Abstract

This study examines the attitudes, beliefs, and experiences of faculty and students about the use of non-traditional pedagogies such as active learning, collaborative/cooperative learning, and the encouragement of student participation and involvement in the learning experience. The data for this study came from two surveys of faculty and students conducted through the National Center for Postsecondary Improvement (NCPI) at seven institutions during the winter and fall of 2000. The results reveal that both groups agree on the value and desirability of direct involvement in learning, academic collaboration with student peers, and productive, constructive student/faculty relationships. There are substantial, statistically significant differences, however, between how frequently they believe these practices are actually enacted in the classroom. Possible explanations and implications are discussed.

Introduction

In the past two decades, there have been numerous calls for a greater focus on improving undergraduate education ("An American imperative: Higher expectations for higher education," 1993; Blackburn & Lawrence, 1995; Boyer Commission., 1998; "Involvement in learning: Realizing the potential of American higher education," 1984; "Powerful partnerships: A shared responsibility for learning," 1998; Stark & Lattuca, 1997) with particular attention focused on the quality of teaching and learning. More recently considerable attention had been paid to several new pedagogies (Kezar, 2000). Referred to as active, collaborative, and cooperative, all seek to engage students as active, involved participants in their own educations. These non-traditional learning paradigms require a fundamental shift in the classroom from pedagogy that is centered

on providing instruction to one that focuses on learning (Barr & Tagg, 1995). Such paradigms require that faculty become facilitators, coaches, and guides to learning. In so doing, faculty make meaning and learn along with students by moving away from memorization of facts to using and applying knowledge.

Research on the use of these non-traditional paradigms has generally shown positive results leading to greater gains in critical thinking and problem solving skills, greater acceptance and tolerance for diversity, and better performance on subsequent examinations (Cabrera, Nora, Bernal, Terenzini, & Pascarella, 1998; Einarson, 2001; McCarthy & Anderson, 2000). However, less is known about how well these approaches are received inside the classroom, by the students in these classes and the faculty who teach them. In striving to improve undergraduate education, we can benefit from understanding more clearly how students and teaching faculty perceive their roles in, and engagement with the teaching / learning environment and the new pedagogies that can transform it. Do students believe that they learn best with these new pedagogies vs. with traditional methods? What are students' expectations for their learning environment and their involvement with non-traditional pedagogies? How do student perceptions compare to the attitudes and beliefs of teaching faculty about these new pedagogies and their students' abilities, expectations, and learning preferences? This study will provide insight into understanding attitudes and beliefs about new, non-traditional pedagogies as they are experienced first-hand by students and teaching faculty.

Review of the Literature

A number of studies have examined active, collaborative, and cooperative learning methods, comparing their differences and similarities, the ways in which faculty use them, the effects they have on learning outcomes, etc. Participation in non-traditional teaching methods

provides experiences and builds proficiencies such as problem solving ability, team working skills, and tolerance and appreciation for diversity that will serve the student well beyond the college years.

Active Learning

Traditional pedagogy casts the professor as a repository of knowledge, an authoritarian expert whose role in the educative process is to convey knowledge to a receptive student audience (Barr & Tagg, 1995; McCarthy & Anderson, 2000). As such, the student learner is seen as a passive, unquestioning receptacle of that knowledge whose role is to memorize and regurgitate information. Active learning methods seek to engage students directly and actively with the course content by moving away from memorization of facts delivered unilaterally through a lecture format to a dynamic learning environment that facilitates meaning making resulting in a deeper understanding and the ability to make connections and use knowledge beyond the classroom. The use of active learning methods requires a fundamental shift in classroom pedagogy from one that is centered on providing instruction to one that focuses on learning (Barr & Tagg, 1995) and an equally fundamental change in the role of faculty in the classroom. The role of the teacher becomes that of a facilitator, which is fundamentally different from the role of the teacher as an instructor. Equally transformed is the instructor's relationship with the learner which becomes more like a partnership whose mutual goal is student growth and learning (Hansen & Stephens, 2000). In the role of facilitator, faculty become coaches and guides to learning; they make meaning and learn along with their students by moving away from memorization of facts to using and applying knowledge.

Active learning utilizes methods that involve students more directly in the learning process such as one-minute papers and similar in-class exercises that require active engagement

with the material and provide feedback to the student, journaling and other reflective exercises that require the student to examine her/his experience with the process of learning as well as the product, and by asking students to prepare questions related to the material being covered and engage in class discussion. Active learning activities assist students in making the transition from a dependent relationship with the instructor as sole arbiter of knowledge to one where they recognize multiple sources and authorities of knowledge, including themselves.

Collaborative & Cooperative Learning

Both collaborative and cooperative learning methods emphasize the benefits to students of working directly with peers in small heterogeneous groups to engage with the material, solve problems, and learn in a communal, supportive environment. Additionally, they purposefully seek to reduce the amount of competition between individual students, stressing instead mutual learning and support.

Cooperative learning is not a zero sum game, "since the teaching methodology encourages students to work in small heterogeneous groups and to assist each other to attain mastery rather than the establishment of competition and environments of winners and losers" (Hagedorn, Moon, Buchanan, Shockman, & Jackson, 2000, p. 7). The group-learning environment allows students to benefit from working in conjunction with more capable peers while those more capable students also benefit from the interaction with their less capable peers. Slavin demonstrated that cooperative learning improved academic performance and other measures of student achievement, and encouraged inter-group relations with the result that students exposed to cooperative learning were more likely to develop cross-racial working relationships and friendships than those exposed only to traditional learning environments (cited in Hagedorn et al., 2000).

Collaborative learning also restructures the classroom curriculum away from the traditional lecture format toward work in small groups striving to solve complex problems through intensive interactions between students with less involvement and direct supervision from the instructor. Learning is enhanced as students develop interdependence with knowledgeable peers. "Collaborative learning calls on levels of ingenuity and inventiveness that many students never knew they had; it teaches effective interdependence in an increasingly collaborative world that today requires greater flexibility and adaptability to change than ever before" (Bruffee, 1987p. 47).

Collaborative and cooperative learning share many of the same characteristics, however, they differ in two important ways. First, they were originally developed to meet the educational needs of people of differing ages and with differing levels of maturity and ability. Cooperative learning was originally developed for use with school children, whereas collaborative learning was designed to take advantage of the knowledge, skills, and maturity level of adolescents and adults.

Second, and partially as a consequence of their intended audiences, the two methods make different assumptions about knowledge and authority in the classroom (Bruffee, 1995). Collaborative learning is based on the concept of social constructivism that recognizes that knowledge is co-constructed, situated in the social environment, and occurs among people rather than between people and things (Gerlach, 1994). As a consequence it seeks to transfer authority and responsibility for learning from the instructor to the student groups (Bruffee, 1999; Flannery, 1994). In contrast to the highly individualized, competitive environment of traditional pedagogies, students learn more effectively through non-competitive, collaborative experiences

where outcomes often exceed participants' expectations for what could have been learned or accomplished separately (Bruffee, 1987).

Because cooperative learning was originally developed for use with school children, the instructor is obliged to retain a more authoritative role with more responsibility and direct involvement with the group process. The instructor may assign students to groups, may monitor and intervene frequently in the group process, and will supervise closely and assess regularly in order to "make sure that students are always accountable and neither compete individually nor become chronically dependent upon one another" (Bruffee, 1995, p. 16). Although designed with younger students in mind, the more structured regimen of cooperative learning methods are often appropriate in many college classroom situations.

Because they both focus primarily on the benefits derived from working with peers, the distinctions between collaborative and cooperative learning are often blurred. Whether called collaborative or cooperative, working collectively requires skills and awareness that don't come naturally; teamwork must be taught and practiced as an integral component for either of these pedagogical strategies to be successful (Bosworth, 1994; Bruffee, 1995; Walker & Angelo, 1998). While active learning does not necessarily emphasize working directly with peers, the shared goal of all three of these pedagogies is to engage students more directly in the learning experience and foster a sense of involvement and responsibility for one's own learning. They may also include students more actively in the assessment/evaluation process through such techniques as requiring students to assemble portfolios to document their academic achievement, student involvement in the grading process, and requiring accountability to self and peers as well as to the instructor (Dalziel, 1998; Palomba & Banta, 1999).

Gains and Benefits

Although there are distinct differences among these pedagogies that distinction is often not made and the terms are frequently used interchangeably. Kuh, Pace, & Vesper (1997) found that increased faculty-student contact, cooperation among students and active learning were the best predictors of student educational gains in college. Experience with and preference for active and collaborative learning were found to predict gains in cognitive development, affective level, and openness to diversity (Cabrera et al., 1998). Similarly, a study by Slavin (cited in Hagedorn et al., 2000) found that cooperative learning encouraged inter-group relations with the result that students were more likely to develop cross-racial working relationships and friendships than those exposed only to traditional learning environments. Volkwein & Cabrera (1998) found that the factors in the undergraduate experience that are most strongly associated with vitality in the classroom were high levels of faculty concern and interaction with students, and students' own active engagement in the academic and social structures of the institution. In an experimental design that compared students who participated in role-plays and collaborative exercises to control groups that received only traditional instruction, McCarthy & Anderson (2000) demonstrated that these exercises contributed to increased student participation and engagement with the material, higher levels of student satisfaction with their learning experience, and improved performance of subsequent evaluations. A meta-analysis of 133 research studies of adults comparing the relative effectiveness of cooperative, competitive, and individualistic efforts showed that cooperative learning promotes achievement, positive interpersonal relationships, and self-esteem (Johnson & Johnson, 1987). Collaborative pedagogy, particularly in a problem-based learning environment results in positive effects on student confidence,

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greater clarity in reasoning, analysis, and problem-solving skills, and higher levels of student achievement (Cockrell, Caplow, & Donaldson, 2000).

Benefits of these non-traditional pedagogies are numerous and perhaps of equal importance, the results hold true for students regardless of class, race, gender, and varying levels of academic preparedness (Gamson, 1994). The results are impressive, but the research focuses mainly on benefits to students and improvements in outcome measures. Do these non-traditional methods serve students well from the *students'* point of view? Do students believe that they learn best with these methods? What are their expectations for their learning environment and their involvement with non-traditional pedagogies? How do these compare to the attitudes and beliefs of teaching faculty about these new pedagogies and their students' abilities, expectations, and learning preferences?

Method

Data Source

The data for this study came from two surveys of faculty and students conducted through the National Center for Postsecondary Improvement (NCPI) at seven institutions during the winter and fall of 2000. These institutions were chosen based on their involvement in national teaching and assessment innovation initiatives. The faculty and student surveys ("Faculty Survey on Teaching, Learning, and Assessment" (FSTLA) survey and the "Student Experiences with Teaching, Learning, and Assessment" (SETLA) survey) were developed by the research program on Academic Programs and Students for NCPI. These instruments were used by NCPI as part of a set of institutional case studies that examined attitudes, beliefs and behaviors related to teaching, learning, and assessment at both the institutional and individual levels.

Sample

All faculty members in the selected departments (English, Chemistry, Mathematics, and Psychology) with undergraduate teaching assignments were surveyed. Of the 136 faculty respondents, the majority were 57% male, white (91%), and had been employed for an average of 20 years of higher education. A vast majority of faculty (95%) were tenured or had tenure track appointments. The student respondents (n=676) were also predominantly white (84%) and ranged in age from 17 to 54 years with a mean age of 20 years. More than three quarters of the students were pursuing baccalaureate degrees and 93% were doing so on a full time basis.

Measures and Analyses

The two surveys included numerous sets of mirrored items, asking virtually the same questions worded appropriately for the respondent group. See Table 1. Descriptive statistics, frequencies, and t-tests of means were used to examine the data. Factor analysis was conducted using principle component analysis with varimax rotation to reduce the data and produce a number of matched student/faculty pairs of factors. The mean scores on each of the factors were extrapolated to percentage estimates for the purpose of exposition. Given the cohesive nature of the items associated with each of the factors, the extrapolated percentages reported below effectively capture the average responses provided by the respondents (though clearly a natural range of percentages would be generated across the individual items). Comparison of pairs of faculty / student factors and selected single item variables were used to reveal the similarities and differences between perceptions and attitudes regarding active and collaborative/cooperative learning, the use of innovative techniques, and encouragement of student participation and involvement in learning.

Table 1: Variables and Definitions

Factor Scale or Variable Name	Factor loading & alpha		Definition & Coding
	Faculty	Student	
Use of Active Learning Techniques	**α=. 81**	**α=. 59**	
Require multiple drafts of student written work for progressive feedback	.80	.66	Number of courses in which these techniques are utilized
Use small group work/group projects	.78	.63	(1=none, 2=some, 3=most/all-
Require student in-class presentations	.76	.68	recoded)
Use short in-class writing exercises	.65	.39	
Explicitly state goals for student learning	.46	.52	
Encouragement of Student Involvement in the Classroom	**α=. 59**	**α=. 72**	
Listen to students' concerns, and take them into account in my teaching	.75	.60	Frequency with which these techniques are utilized
Work to get students to ask questions	.72	.49	(1=not at all, 2=occasionally,
Design classes to be highly interactive	.67	.49	3=frequently)
Beneficial Aspects of Peer Learning	**α=. 74**	**α=. 85**	
Have a better grasp of course concepts when they discuss concepts with peers	.82	.87	Level of agreement on statements about students learning experience
Understand material better when they also hear course concepts explained by peers	.80	.85	(1=disagree strongly, 2=disagree somewhat, 3=agree somewhat,
Understand the complexity of a topic better after exchanging ideas with peers	.58	.87	4=agree strongly)
Encourage Student Collaboration	**α=. 64**	**α=. 57**	
Encourage students to act as "peer mentors"	.79	.79	Frequency with which utilized (1=not at all, 2=occasionally,
Ask students directly whether they understand course material	.75	.44	3=frequently)
Encourage students to collaborate on course work	.62	.77	
Challenging, Independent Learning Environment	**α=. 63**	**α=. 63**	
A challenging learning experience	.81	.77	Level of agreement about what
Opportunities to pursue subject matter further	.76	.72	students expect (1=disagree strongly, 2=disagree
Extensive one-on-one interaction	.59	.30	somewhat, 3=agree somewhat,
Availability during office hours	.44	.56	4=agree strongly)
Clearly articulated expectations for coursework	.38	.56	

Table 1: Variables and Definitions, continued

Factor Scale or Variable Name	Factor loading & alpha		Definition & Coding
	Faculty	Student	
Assistance with Learning	**α=. 62**	**α=. 68**	
Extensive use of audio/visual aids	.66	.69	Level of agreement about what students expect
Outlines and other printed course aids	.64	.69	(1=disagree strongly, 2=disagree
Opportunities to redo assignments to improve grades	.57	.71	somewhat, 3=agree somewhat, 4=agree strongly)
An entertaining lecture style	.53	.65	
Frequent summaries of key concepts	.38	.50	
Students' Level of Satisfaction with Academic Relationships		**α=.81**	
Contact with faculty and administrators		.705	
Formal opportunities to take stock of your academic achievement		.697	Level of student satisfaction (1=no exp, can't rate, 2=dissatisfied,
Academic advising		.674	3=neutral, 4=satisfied, 5=very)
Overall relationships with faculty and administrators		.654	
Opportunity to discuss coursework outside of class with professors		.504	

Table 1: Variables and Definitions, continued

Single Item Variable Name	Faculty/ Student/ Both	Definition & Coding
Discussed your goals for learning with an instructor either in or outside of class	Student	Frequency with which utilized or encountered
Felt encouraged to ask questions in class	Student	(1=not at all, 2=occasionally,
Felt inhibited from participating in class discussion	Student	3=frequently)
Received advice based on performance on exams, homework, etc	Student	
Received feedback only in the form of a final grade	Student	
Try new teaching practices	Faculty	
Use student performance information to evaluate my own teaching	Faculty	
Incorporate short class activities	Both	
Feedback more than 3 times per term	Both	
Met outside of formally scheduled times	Both	
Depend on same teaching routines year after year	Both	
In-class presentations reinforce important skills	Student	Level of agreement
I find lecture only classes boring and would rather be doing something active in class	Student	(1=disagree strongly, 2=disagree somewhat, 3=agree somewhat,
Think it a good idea for students to help each other learn	Student	4=agree strongly)
Try to share ideas with other student when think it will help them	Student	
Can learn important things with other students	Student	
Group work is a waste of time	Student	
Expect frequent and extensive feedback	Student	
Written assignments help me make sure I understand the course material	Student	
Learn more when questions and discussion are kept to a minimum	Both	
Want more feedback than grades or exam scores	Both	

Results

The results of this study reveal that students and faculty generally hold similar beliefs regarding the importance and efficacy of active learning and the value of direct participation in

the educational process. There are substantial, statistically significant differences, however, between how frequently they believe these practices are actually enacted in the classroom.

Active Learning

Students report that direct, active involvement in the learning process is important to them. See Tables 2 and 3. Most (91%) students believe that they learn best through in-class activities that require their active participation, such as class discussion and questioning. Nearly 70% felt encouraged to ask questions during class and 78% rarely felt inhibited from participating in class discussion. Approximately three quarters of students agree that active involvement through activities such as in-class presentations (73%) and writing assignments (79%) aid their learning and build important skills, and most (85%) find lecture-only classes sometimes boring, and would rather be doing something active in class.

Table 2: Comparison of Faculty / Student Factors* and Single Variables: Active Learning

	Percentage answering 'frequently'	
Measures	Faculty	Students
Encouragement of Student Involvement in the Classroom	**78.9**	**28.8**
Use of Active Learning Techniques	**63.9**	**8.6**
Listen to student concerns, take them into account in teaching	70.9	31.7
Ask directly whether students understand course material	82.8	28.1
Work to get students to ask questions during class	90.3	41.3
Design classes to be highly interactive	58.6	21.3
Incorporate short class activities	56.8	14.3
Explicitly state to students your goals for student learning	85.8	48.1
Depend on same teaching routines year after year	12.1	25.3
	Percentage agreeing or agreeing strongly	
Learn more when questions and discussion are kept to a minimum	7.0	8.9

* Factors are in boldface type
All tests of means were significant at $p<.001$.

Table 3: Selected Single Faculty and Student Variables Active Learning

	Percentage answering 'frequently'
Faculty Measures	
Try new teaching practices	57.2
Use student performance information to evaluate my own teaching	75.7
Student Measures	
Felt encouraged to ask questions in class	69.7
Felt inhibited from participating in class discussion	22.3
	Percentage agreeing or agreeing strongly
Written assignments help me make sure I understand the course material	78.5
In-class presentations reinforce important skills	73.2
I find lecture only classes boring and would rather be doing something active in class	85.0

Likewise, most faculty (93%) believe that students learn best in an active learning environment and incorporate such beliefs in their pedagogy. A majority of faculty explicitly design their classes to be highly interactive on a frequent basis (59%) while an additional 36% do so some of the time. A majority also incorporate short exercises and activities in their classes on a frequent (57%) or occasional (34%) basis. The majority (57%) of faculty elect to introduce new or experimental teaching practices into most or all of their classes with an additional 39% doing so in some classes. Very few (12%) rely frequently on the same teaching routines year after year. In most or all of their classes, a majority (86%) of faculty explicitly state their goals for student learning. More than three quarters of faculty (76%) consider their students' performance and achievement of those goals when evaluating the efficacy of their own teaching.

However, there is a marked disparity over how often students and faculty believe these techniques are actually employed. Overall, faculty believe they foster an interactive, participative classroom environment much more frequently than students believe this occurs. There is a

substantial and statistically significant ($p<.001$) disparity between the perceptions of faculty and students regarding the extent to which participation and questions are actively encouraged during class. A majority of faculty (79%) frequently encourage students' active participation and involvement in the classroom, whereas only 29% of students recall such encouragement. Likewise, a majority (64%) of faculty believe they frequently utilize active learning techniques in their classes, as compared to only 9% of students. An overwhelming majority of faculty take pains to encourage students to ask questions (90%) and inquire directly during class as to whether students understand the material being covered (83%). However, less than half (41%) of students think that faculty frequently strive to get students to ask questions, although students report that they only rarely feel inhibited from participating in class discussion or asking questions, and even fewer (28%) recall that faculty frequently ask if they understand the material. More than 70% of faculty believe that they frequently listen to student concerns and incorporate those concerns in their teaching practices, while only 32% of students believe this happens on a frequent basis.

Students believe their classes provide them with opportunities for interaction and direct participation much less frequently than instructors believe they provide these opportunities in their class design. While a majority of faculty believe they offer highly interactive classes frequently, few (21%) of student believe their classes are highly interactive and even fewer (14%) recall a frequent inclusion of short exercises and activities in their classes. These differences in perception are also statistically significant at the $p<.001$ level. These results are included in more detail in.

Collaborative & Cooperative Learning

A substantial majority of both faculty and students (85% and 80%, respectively) believe that collaborative, cooperative learning enhances the learning experience. The difference between the factor means is not statistically significantly. See Tables 4 and 5. An overwhelming majority of faculty (92%) believe that students grasp concepts better when they engage in discussion with peers; 80% of students believe likewise. A majority of faculty and students (83% and 80%, respectively) also agree that students' understanding of the complexity of subject matter is enhanced by engagement with their peers. A majority (55%) of faculty assign group projects and utilize other small group work and in most or all of their classes with an additional 35% doing so in some classes.

Table 4: Comparison of Faculty / Student Factors* and Single Variables: Collaborative & Cooperative Learning

	Percentage answering 'frequently'	
Measures	Faculty	Students
Encourage Student Collaboration	**75.7**	**20.7**
Use small group work/group projects	54.9	22.1
	Percentage agreeing or agreeing strongly	
Beneficial Aspects of Peer Learning**	**84.6**	**79.8**
Have a better grasp of concepts when discussing with peers	91.5	80.2
Understand complexity of a topic better after exchanging ideas w/ peers**	83.0	80.3

* Factors are in boldface type
** not statistically significant, all other test of means were significant at p<.001.

Table 5: Selected Single Faculty and Student Variables Collaborative & Cooperative Learning

Student Measures	Percentage agreeing or agreeing strongly
Think it a good idea for students to help each other learn	73.9
Try to share ideas with other student when think it will help them	62.4
Can learn important things with other students	62.0
Group work is a waste of time	17.7

Nearly three quarters of students (74%) think it is a good idea for students to help each other learn, and a majority (62%) try to share ideas with others when they think it will help them learn. A majority (62%) also believe that they can learn important things working collaboratively with other student peers, and the vast majority (83%) believe that collaborating with their peers in group activities is time well spent.

However, while both groups believe in the value of collaborative, cooperative learning, as with active learning pedagogies, they disagree significantly ($p<.001$) as to how frequently these practices are utilized. More than three quarters (76%) of faculty encourage student collaboration and peer mentoring on a more than occasional basis as compared to only 21% of students.

Gains, Benefits, and Expectations for the Learning Process

Students have high expectations for a stimulating learning environment and active involvement with their faculty. A substantial majority (89%) of student respondents agreed that they expect faculty to create a challenging learning experience and provide opportunities to pursue subject matter further. Students also want faculty to be available to them both during office hours and for direct interaction on a one-to-one basis. Similarly, more than three quarters (77%) of responding faculty also believe that this is what students expect of them.

More than two thirds (69%) of students also have the expectation that faculty will provide numerous types of aids to assist their learning. This measure includes items such as frequent summaries of key concepts, extensive use of audio and visual aids, outlines and other printed course materials. They also expect an entertaining lecture style and the opportunity to redo assignments to improve their grades. Although less than half (47%) of faculty agree on all these measures that this is what students expect, a large majority agree with student expectations for entertaining lecture style (88%), frequent summaries of key concepts (84%), and outlines and other printed course materials (83%)

An important aspect of the creation of an active engaged lea ng environment is the relationships students are able to forge with their faculty. This includes formally scheduled opportunities for interaction such as feedback on their academic performance and meeting with faculty during scheduled office hours, as well as informal interactions taking place outside the classroom environment. Feedback is an important mechanism in creating an open and continuous dialogue with students to foster academic growth and improvement and provide constructive criticism and an opportunity for students to interact directly with their faculty. See Tables 6 and 7. A large majority (85%) of students agree that they want more feedback on their work than just grades and exam scores, and 80% have an expectation of receiving frequent and extensive feedback on their work. Although a majority of faculty (67%) believe likewise the difference is statistically significant ($p<.001$). Additionally, perception of how often feedback occurs differs dramatically; 90% of faculty believe that they frequently provide multiple feedback opportunities as compared to only 17% of students recalling receiving such feedback experiences.

Table 6: Comparison of Faculty / Student Factors* and Single Variables: Gains, Benefits, and the Importance of Process

Measures	Percentage answering 'frequently'	
	Faculty	Students
Feedback more than 3 times per term	90.2	16.8
Met outside of formally scheduled times	86.9	6.8
	Percentage agreeing or agreeing strongly	
Challenging, Independent Learning Environment	**77.3**	**88.8**
Assistance with Learning	**47.3**	**69.7**
Want more feedback than grades or exam scores	67.0	85.4
Extensive one-on-one interaction	56.3	62.0
Availability during office hours **	95.8	98.5
Expect frequent summaries of key concepts **	83.8	92.3
Expect outlines and other printed course aids **	82.5	87.9
An entertaining lecture style **	88.0	87.1

* Factors are in boldface type
** not statistically significant, all other test of means were significant at p<.001.

Table 7: Selected Single Faculty and Student Variables Gains, Benefits, and the Importance of Process

	Percentage answering 'frequently'
Student Measures	
Received advice based on performance on exams, homework, etc	36.7
Discussed your goals for learning with an instructor either in or outside of class	35.0
Received feedback only in the form of a final course grade	35.2
	Percentage agreeing or agreeing strongly
Frequent and extensive feedback	80.0
	Percentage satisfied or very satisfied
Students' Level of Satisfaction with Academic Relationships	37.7

Nearly all students (99%) and faculty (96%) agree that student should expect faculty to be available during office hours and nearly two thirds (62%) of students expect extensive one-on-one interaction with faculty. Faculty report that they interact with and provide feedback to students much more frequently than students reported experience. A majority (87%) of faculty believe that they meet with students outside of formally scheduled times on a frequent basis as compared to only 7% of students. Approximately a third (35%) of students regularly received feedback only in the form of a final course grade. Similarly, only a third (37%) of students report that they received advice based on their performance on exams or homework several times or more during the past year. And only 35% of students had the opportunity to discuss their goals for learning with an instructor either in or outside of class.

Not surprisingly the majority of students (62.3%) of students are less than satisfied with their relationships with faculty. This measure includes students' satisfaction with their overall relationships with faculty, the level of contact with faculty, and opportunities to discuss coursework outside of class with professors, and take stock of their academic achievement.

Limitations

The surveys used in this study elicit respondents' self-reports of attitudes, beliefs, and behaviors. Accordingly, there are limitations associated with self-rating bias inherent in the data used for this analysis, including a possible tendency for respondents to answer in a manner they believe will present themselves to researchers in a more favorable light and the potential that personal perception may not always be an accurate reflection of true behaviors and attitudes. Certain variables may be more likely than others to reflect inaccuracies. For example, students may be overly idealistic in describing their expectations and preferences, or faculty may tend to

over-report their engagement with non-traditional pedagogies or over estimate their interactions with students.

The surveys were administered separately to unrelated faculty and student groups without attempting to match them as to classroom assignment. Future research may take this approach to better understand differences in faculty and student perceptions of experience in matched classroom environments.

In the faculty survey the volume of responses from one Research University was disproportionately high, dwarfing the responses levels of the other institutional types included in the survey. Accordingly, weighting techniques were applied to adjust the impact of these cases in the analyses.

Discussion

In this study, we examined the attitudes, beliefs, behaviors, and experiences of faculty and students about the college learning experience and non-traditional pedagogies. While both faculty and students hold very similar beliefs and attitudes toward active, collaborative, and cooperative learning and direct engagement with the learning process, they differ substantially over how frequently these practices are actually utilized. Both groups agree on the value and desirability of active learning, academic collaboration with student peers, and productive, constructive student/faculty relationships.

Students have expectations for a challenging, stimulating learning environment, believe they learn better in a collaborative with their peers, and want positive, interactive relationships with their faculty. Likewise, faculty acknowledge and agree with student expectations and preferences, and believe that they are indeed providing such things. They explicitly design interactive classes, incorporate in-class activities, discussion, and encourage dialog. They believe

that student learning is enhanced through collaborative/cooperative pedagogy and design their classes accordingly, providing opportunities for group work and encouraging collaboration. They strive to create an encouraging, supportive environment in which students receive frequent feedback and have the opportunity to interact with faculty on an informal unstructured basis, as well as inside the classroom and during formally scheduled office hours.

However, from the students' point of view, these expectations and preferences are not being met with any regularity. The source of this disparity of perception is puzzling. Are faculty overestimating the effect of what they do? Is it the nature of students to be idealistic in describing their preferences and disaffected with reality? Is it a difference of semantics?

While 90% of faculty report that they frequently provide feedback more than three times per term, only 17% of students say this happens on a frequent basis. It is possible that actions such as grades on minor papers and assignments, which faculty consider feedback are overlooked by students or not counted as such. Perhaps faculty consider grades to be feedback whereas students define it only as written or oral commentary and critique of their work. A majority of faculty say they frequently design their classes to be highly interactive (59%) and frequently use short in-class activities (57%) whereas few students (21% and 14%, respectively) report these occurring frequently. There may be differences of perception as to what constitutes a 'highly interactive' class or how often constitutes 'frequently'. A professor may attend scheduled office hours regularly and believe this activity provides a recurring opportunity for students to obtain feedback and interact with faculty, yet students may for any number of reasons not attend offices hours. Students may express a desire for a challenging participative learning experience, then not take advantage of the opportunities available and fail to take a certain amount of initiative and responsibility for engaging in their learning experience. A majority (87%) of

faculty believe that they meet with students outside of formally scheduled times on a frequent basis as compared to only 7% of students who reported that they did so. It is possible that a professor frequently chats with students during his morning stop at the coffee shop. The professor considers these interactions as 'meeting with students outside of formally scheduled times' whereas students may consider them only chance encounters.

Faculty believe they are providing opportunities for student involvement and engagement through enacting active, collaborative pedagogies, and creating a supportive, challenging learning environment, yet students don't perceive it to be so. It would seem that despite our efforts we are failing to meet our students' needs and expectations for their academic experience.

Whatever the reason for the disparity, semantic or perceptual, as educators we need to address this issue by being more transparent in our pedagogy, more explicit about our intentions and methods, and stating clearly our expectations and learning goals to our students. Finally, we must assess, as realistically as possible, whether from our students' perspective we are in fact doing what we say we are.

Importance of the Findings

This study is important in gaining a more precise understanding of the attitudes and beliefs about these new, non-traditional pedagogies, as they are experienced by students and teaching faculty first-hand, within the classroom. As discussed above, research has shown that participation in these pedagogies is effective in teaching skills, abilities, and building proficiencies, including enhanced multicultural competencies that enable students not only to succeed academically, but also go on to become more successful members of society. As institutions of higher education, we can no longer exist solely as gatekeepers of knowledge, but must evolve as institutions of reacculturation, viewing ourselves not only as creators and

purveyors of information but also as agents of cultural change in transforming our students and preparing them for their futures. Our mission, in part, is to produce students who are able to contribute meaningfully to our ever more interconnected, global economy; to function as productive employees and responsible citizens. Institutional research can play a vital role in coordinating the curricular and co-curricular initiatives that promote campus-wide efforts to improve student preparation for competence, interdependence, and success in an increasingly collaborative world. We believe that institutional research can utilize this project's findings to pursue curricular reforms more effectively at both the department and the institutional level.

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